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BIRD NOTES FROM A WINTER VISIT TO ECLIPSE ISLAND, WESTERN AUSTRALIA

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The following notes result from a short visit to Eclipse Island, Western Australia, in the winter of 1973. We arrived by boat from Emu Wharf, Albany on 2 August, and made our return on 9 August. We have included some sea-bird observations from these passages.

A general description of the birds of Eclipse Island was given by Warham (1955a). Also, there are more detailed accounts based on observations made at this island with respect to the Great-winged Petrel, *Pterodroma macroptera* (Warham, 1956, 1957), Fleshy-footed Shearwater, *Puffinus carneipes* (Warham, 1958), and the Little Shearwater, *Puffinus assimilis* (Glauert, 1946; Warham, 1955b).

In size the island is about 160 hectares and rises to its highest point at 108 metres where the lighthouse is situated (Fig. 1). The island is granitic with much of it covered in thick scrub, predominantly *Melaleuca lanceolata* (see for example Fig. 4, p. 11, Serventy *et al.*, 1971). In places other shrubs such as *Leucopogon revolutus, Verticordia plumosa, Andersonia sprengelioides, Hibbertia cuneiformis, Boronia alata, Calocephalus brownii* and *Chorilaena quercifolia*, form a compact low cover, in particular along the western ridge. Some *Casuarina* sp. occurs in places on the steeper northern slopes. Extensive areas of the N.W. of the island were burned by a severe wildfire in 1968. Much of the south-east side of the island is rocky and covered only by very short, cushion-like vegetation, predominantly *Verticordia plumosa*. Cliff Head and the isles off the western end are bare rock. A predominant introduced plant is a South African Arum lily, *Zantedeschia aethiopica*, which was in flower at the time of our visit. Open ground was otherwise closely covered by Pigface, *Carpobrotus aequilaterus*.

Lighthouse structures include an abandoned jetty and "Flying Fox". A bulldozed track leads from the new landing facilities to the light-station cottages close to the light-tower at the top of the island. Here there are several additional sheds and stores, some water storage tanks, radio transmission towers and wires, and a power generation plant. Some cleared areas and several additional tracks have been introduced since the island was first occupied in 1925.

Vertebrates on the island, other than a few domestic pets including the Domestic Pigeon, *Columba livia*, are the Rabbit, *Oryctolagus cuniculus*, and a small breeding colony of the Australian Sea-lion, *Neophoca cinerea*. The Rabbit is not numerous and appears to be in little conflict with the breeding avifauna. The history of its introduction is apparently undocu-

mented. Lizards are numerous and four species were noted, Marbled Gecko, *Phyllodactylus marmoratus;* King's Skink, *Egernia kingii;* Salmon-bellied Skink, *Egernia nitida,* and Yellow-bellied Skink, *Hemiergis peronii.*

To assess the breeding status of the Great-winged Petrel and the Little Shearwater, eight study plots, of 20 x 20 metres each, were searched thoroughly (Fig. 1).

The following annotated list summarises our observations.

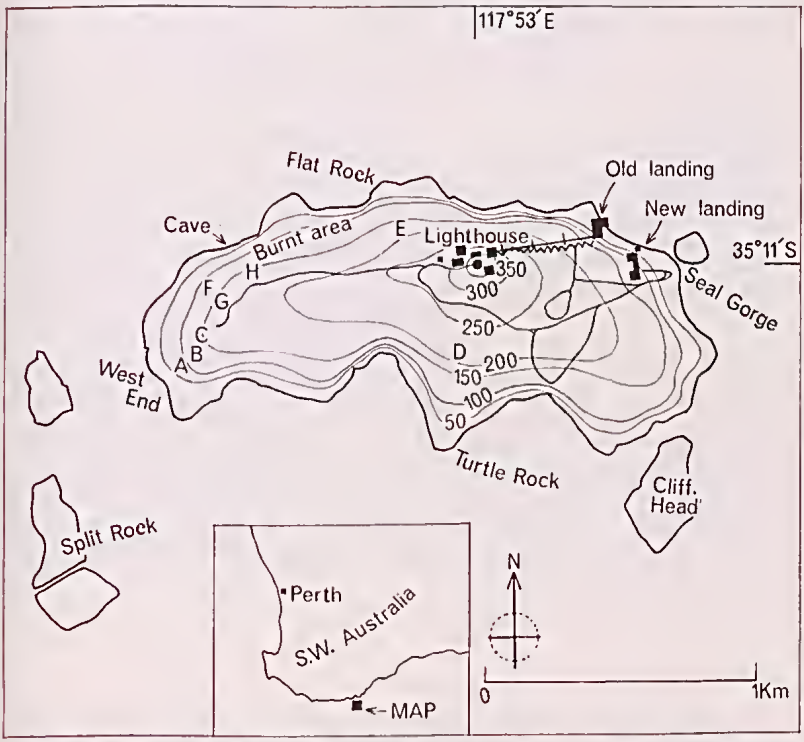

Fig. 1.—Map of Eclipse Island, Western Australia showing general features and contours at 50 foot intervals. Note, in particular, the location of tracks leading from the landing place to lighthouse; the track towards the west-end, the "flying-fox" between the quarters and the old landing site and eight plots (A to H) that were surveyed in detail for nesting petrels.

THE BREEDING BIRDS ON ECLIPSE ISLAND

Warham (1955a) lists 12 species that possibly breed on the island. We saw 11 of them and strongly suspect that the remaining bird, the Spotless Crake, *Porzana tabuensis* is no more than a vagrant (see later). We could add no additional species except possibly the Brown Goshawk, *Accipiter fasciatus,* and the Laughing Kookaburra, *Dacelo gigas.*

Little Penguin, *Eudyptula minor*

A few heard at dusk on the sea and at night under shrubs and trees. A couple of skeletons were collected, but this penguin did not appear to be common on the island.

Great-winged Petrel, *Pterodroma macroptera*

One was seen in the entrance to King George Sound 2 August. One was seen between Eclipse Island and the mainland and one was seen in the entrance to King George Sound 9 August.

This petrel nests over much of the island (Fig. 2). Nest sites were mostly well scattered, either in shallow burrows or more frequently using only the cover provided by the small isolated clumps of scrub. Such wind-shorn clumps would often shelter several chicks or incubating adults on surface nests to which access was gained from the perimeter of the bush. The highest density we noted was near the western end of the island. Here on one plot we counted 23 occupied sites in 400 square metres. Very few petrels were nesting in the severely burnt areas and in the short dense regrowth of *Melaleuca* either side of the road on the lower levels east of the lighthouse. Some concentration of sites was noted on the talus slopes around the lighthouse hill, particularly on the southern side. Some petrels were found at sites very close to the living quarters and even against the walls of the very noisy electric power generation plant building! In all, 60 nest sites were located and examined in detail. Of this number 37 were surface nests, 18 were inside 30-45 cm burrows; leaving only five sites where the burrows were between 60 cm and 90 cm in length. Again, 40 of these sites were below bushes (most often *Melaleuca)* 60 cm to 240 cm tall and 20 had only short cover, usually Pigface.

Most of the eggs hatched before our arrival, since we recorded 43 unattended chicks against seven adults still sitting on eggs. However, unattended eggs were found almost as often as those with the adult sitting. Warham (1956, 1957) suggests that hatching occurs from early to mid-July, which would be consistent with our observations. Several eggs hatched during our stay. The body weights of chicks varied from 50 g to 375 g, with an average from 45 chicks of about 175 g. Four eggs on the point of hatching weighed about 43 g, 65 g, 71 g, and 88 g. A three day old chick weighed 75 g. At this stage its bill was shiny jet black, the legs were pale-grey to creamy and the webs creamy. The down was grey-black. A persistent egg-tooth was noted on most chicks at body weights below 120 g (eight with against three without). However, body weight is not a very reliable indication of age even in small chicks of petrels, since enormous increases can follow meals. Also according to Warham (1967), the small chicks of the similar White-headed Petrel, *Pterodroma lessoni,* tend to lose

Fig. 2.—Distribution of nesting Great-winged Petrels, *Pterodroma macroptera* on Eclipse Island, Western Australia.

15 to 20 g per day when not fed. We recorded the same rate of weight loss with four Eclipse Island Great-winged Petrel chicks reweighed after four days.

TABLE 1.—SOME MEASUREMENTS FROM 10 BREEDING GREAT-WINGED PETRELS, *PTERODROMA MACROPTERA*, ON ECLIPSE ISLAND, WESTERN AUSTRALIA. THE MEASUREMENTS FROM 20 EGGS ARE ALSO GIVEN.

		Range	Mean	± S.D.
Culmen	to 0.1 mm	32.7 - 36.8	34.9	1.3
Tarsus	to 0.1 mm	43.3 - 45.6	44.2	0.7
Wing	to 1.0 mm	304 - 314	309	5
Tail	to 1.0 mm	110 - 128	125	5
Weight	to 10 g	440 - 500	478	21
Egg width	to 0.1 mm	40.2 - 50.0	47.6	2.1
Egg length	to 0.1 mm	60.1 - 68.8	65.1	2.4

The length of the exposed culmen of the newly hatched chick is nearly 20 mm, and the tarsus is also about 20 mm long. Some egg dimensions and measurements from 10 adults have been summarised in Table 1. These dimensions for adults do not differ from a small sample of measurements given by Murphy and Pennoyer (1952), for the race *P. m. macroptera*. Also, they are in general agreement with those given by Swales (1965) for eight birds measured on Gough Island, South Atlantic. In some individuals, slight body moult was noted. Filoplumes, as described by Imber (1971), could not be found readily on any of these adult individuals at this stage in the breeding season. Two chicks regurgitated squid eyes, and from a third individual the early stage larva of the Mantis shrimp, *Squilla* sp., was recovered.

Little night-time activity was noted during our stay. Presumably the petrels were quietly flying in to feed chicks, as noted by Warham during the month of September (Warham, 1956). Some aerial courtship chasing accompanied by calling was observed, but this was confined to fewer than 20 birds a night. It occurred over the lee-side of the island in the prevailingly high winds during our stay. These flight calls described by

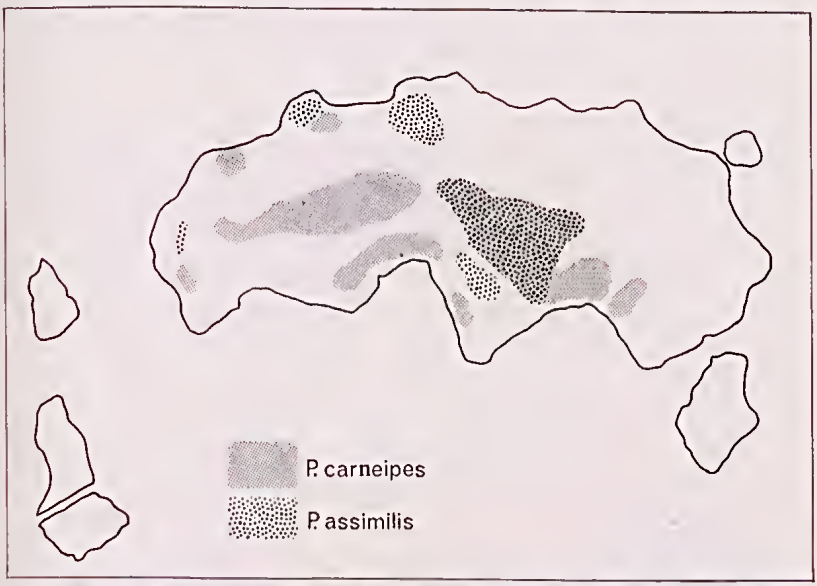

Fig. 3.—Distribution of major nesting colonies of the Fleshy-footed Shearwater, *Puffinus carneipes*, and the Little Shearwater, *Puffinus assimilis*, on Eclipse Island, Western Australia.

Warham (1956) were tape recorded, and representative samples have been deposited in the CSIRO library of bird calls.

The breeding population of Eclipse Island would probably be in the order of 10,000-15,000 pairs.

Fleshy-footed Shearwater, *Puffinus carneipes.*

One was seen and photographed over a school of tuna outside King George Sound 9 August. Nests and skeletons were found at several localities on Eclipse Island where it breeds during the summer.

No birds were seen on Eclipse Island, but an attempt was made to determine the nesting distribution of this Shearwater, and the locations of what we believe to be the colonies have been shown in Fig. 3.

Little Shearwater, *Puffinus assimilis*

One was seen outside the entrance to King George Sound 9 August. On Eclipse Island several recently killed adults were found with the flesh of the neck region eaten away, presumably by a Brown Goshawk.

The distribution of colonies of this Shearwater has been indicated in Fig. 3. Scattered and essentially isolated burrow sites are probably uncommon. The tendency seems to be for groups of Little Shearwater to be associated together or for extensive dense colonies to be formed in particular locations. Notable sites are those to the north-west of the island. Suitability of terrain for burrowing is clearly an important factor. Most burrows were in gritty soils or amongst loose rocks between and behind which these shearwaters can excavate. There is nearly always an open vegetation cover, though dense, tall *Melaleuca* may form a high canopy. Half of 16 occupied burrows which we examined were under 60 cm in length, but 150 cm was the longest found. We believe that fewer than 2,000 pairs of this shearwater breed on the island.

All Little Shearwaters were on eggs, which were well through incubation at the time (see Glauert, 1946). Some egg dimensions and measurements of adults have been summarised in Table 2. For comparison, the dimensions of Lord Howe Island birds have been given (unpublished data, Fullagar and van Tets).

The Eclipse population does not differ significantly in any of these measurements from Lord Howe Island birds. This suggests that distinction of the race *P. a tunneyi* from *P. a. assimilis,* as outlined by Fleming and Serventy (1943), is not supported by our more extensive data from breeding birds.

TABLE 2.—SOME MEASUREMENTS FROM 15 BREEDING LITTLE SHEARWATERS, *PUFFINUS ASSIMILIS* ON ECLIPSE ISLAND, WESTERN AUSTRALIA. MEASUREMENTS OF 17 EGGS ARE ALSO GIVEN. FOR COMPARISON DATA FROM 60 LITTLE SHEARWATERS MEASURED ON ROACH ISLAND, LORD HOWE ISLAND, IN MARCH 1971. (FULLAGAR AND VAN TETS, UNPUBLISHED) HAVE BEEN SUMMARISED.

		ECLIPSE ISLAND			LORD HOWE ISLAND		
		Range	Mean	±S.D.	Range	Mean	±S.D.
Culmen	to 0.1 mm	23.0 - 26.2	24.9	0.9	22.2 - 26.2	24.0	0.9
Tarsus	to 0.1 mm	37.4 - 39.8	38.3	0.9	33.5 - 39.1	37.1	1.1
Wing	to 1.0 mm	173 - 185	179	3	169 - 188	179	4
Tail	to 1.0 mm	61 - 73	68	3	65 - 74	70	2
Weight	to 5 g	165 - 220	195	15	140 - 200	172	14
Egg width	to 0.1 mm*	34.7 - 37.8	36.0	0.9			
Egg length	to 0.1 mm*	46.8 - 54.4	51.9	1.8			

* Glauert (1946) gives measurements of a further 11 eggs from Eclipse Island.

Brown Goshawk, *Accipiter fasciatus*

One was seen on Eclipse Island on 2, 4, 7 and 8 August. It was suspected as a predator of the Little Shearwater.

Nankeen Kestrel, *Falco cenchroides*

One seen on Eclipse Island 2 August.

Sooty Oystercatcher, *Haematopus fuliginosus*

At Eclipse Island at least two were seen 3 August, at least three were seen 4 and 7 August and at least two were seen 8 August. They were seen preying on limpets on the intertidal rocks.

Silver Gull, *Larus novaehollandiae*

At dawn about 200 were seen flying south out to sea at the entrance to King George Sound. One followed the boat out to Eclipse Island.

At Eclipse Island twelve were seen 2 August, at least five were seen 3 and 7 August, and at least six were seen 8 August. It was noted that legs and bills were more *purplish* red in colour than in eastern Australia.

At least 11 circled around the boat while it was fishing for tuna outside King George Sound 9 August.

Rock Parrot, *Neophema petrophila*

One was seen on Eclipse Island 2 August.

Laughing Kookaburra, *Dacelo gigas*

One seen on 8 August. This species is presumably resident on Eclipse Island and possibly preys on the skinks.

Welcome Swallow, *Hirundo neoxena*

At Eclipse Island one was seen 2 August, at least six were seen 3 August. A nest was found in the roof of an open eave at the western end of the island. The contents could not be seen but three swallows were circling back and forth nearby.

Pipit, *Anthus novaeseelandiae*

On Eclipse Island one seen 3 and 4 August.

Western Silvereye, *Zosterops gouldi*

It was very numerous on Eclipse Island.

OTHER SPECIES RECORDED FROM ECLIPSE ISLAND AND THE SURROUNDING SEAS

We saw 15 additional species either on or near the island, though some of them were observed only during the boat crossings. Of most interest was our record of several Sooty Shearwater, *Puffinus griseus*, between King George Sound and Eclipse; the sighting of a Red-tailed Tropic-bird, *Phaethon rubricauda*, over the island, and what appeared to be a sighting of two immature and an adult White-fronted Tern, *Sterna striata*, off the island. We have also had reported to us further descriptions of 'rails' seen on the island in recent years and conclude that they are the Black-tailed Native-Hen, *Tribonyx ventralis*. Eight species recorded by Warham (1955a), were not seen by us.

Wandering Albatross, *Diomedea exulans*

One very white adult was seen off Eclipse Island 3 August. One adult and one immature were seen between Eclipse Island and the mainland 9 August. This was the least common of the albatrosses seen.

Black-browed Albatross, *Diomedea melanophris*

One was seen outside King George Sound 2 August, and two near Eclipse Island 3 August. An adult and an immature were near Eclipse Island at 15.45 hours and four at 16.30 hours on 4 August. Two were seen near the island 8 August. At least two adults and two immatures were seen between Eclipse Island and King George Sound 9 August.

Yellow-nosed Albatross, *Diomedea chlororhynchos*

At least 10 were seen between King George Sound and Eclipse Island 2 August and at least 10 near Eclipse Island 3 August. Three were seen near the Island 4, 7 and 8 August. About 100 were seen over a school of tuna outside the entrance to King George Sound 9 August.

White-capped Albatross, *Diomedea cauta*

One sub-adult and one adult were seen near Eclipse Island 3 August. Two, including an immature, were seen 7 August and one immature was seen near the island 8 August. At least one was seen over a school of tuna outside King George Sound 9 August.

Southern Giant Petrel, *Macronectes giganteus*

A white form was seen inside the entrance to King George Sound 6.30 hours 2 August.

Giant Petrel, *Macronectes* sp.

At least two were seen outside the entrance to King George Sound 2 August. One was seen near Eclipse Island 3 August. At least two were seen over a school of tuna outside the entrance to King George Sound 9 August.

Cape Petrel, *Daption capense*

At least five were seen between King George Sound and Eclipse Island 2 August. One was seen near Eclipse Island 7 August. At least four were seen between Eclipse Island and King George Sound 9 August.

Sooty Shearwater, *Puffinus griseus*

At least ten were seen between King George Sound and Eclipse Island 2 August. At least 12 were seen over a school of tuna outside the entrance to King George Sound 9 August. Some of them landed within four metres of the boat and were photographed. Several of them were showing very worn plumage, particularly among flight feathers. They were immediately recognised by their pale underwing patterns and long bills. The Sooty Shearwater has not been recorded previously in Western Australia. See Fig. 4.

Fig. 4.—Sooty Shearwater, *Puffinus griseus,* one of 12 seen approximately 10 km off Bald Head, King George Sound, Western Australia, 9 August 1973. Note the long bill. Photo, P. J. Fullagar.

The very similar Short-tailed Shearwater, *Puffinus tenuirostris,* has been recorded rarely in Western Australia (see Serventy, 1947, 1948; and Reilly *et al.,* 1975).

White-faced Storm Petrel, *Pelagodroma marina*

Not seen. (Cf. Warham, 1955a, p. 166).

Australian Gannet, *Morus serrator*

At least one immature and one sub-adult seen between King George Sound and Eclipse Island 2 August. One immature was seen near Eclipse Island 3 August. One adult and one immature were seen near Eclipse Island 8 August.

Red-tailed Tropic-bird, *Phaethon rubricauda*

One adult with a pinkish sheen to its body plumage was seen hovering and circling over the west end of Eclipse Island 3 August. It did not

call. It made several dives and passes at a Sooty Oystercatcher flying near the shore over the sea.

White-faced Heron, *Ardea novaehollandiae*
Not seen (cf. Warham, 1955a, p. 167).

Osprey, *Pandion haliaetus*
Not seen (cf. Warham, 1955a, p. 168).

White-breasted Sea Eagle. *Haliaeetus leucogaster*
An adult was seen at Eclipse Island 2 and 8 August.

Swamp Harrier, *Circus approximans*
Not seen (cf. Warham, 1955a, p. 168).

Brown Falcon, *Falco berigora*
Not seen (cf. Warham, 1955a, p. 168).

Spotless Crake, *Porzana tabuensis*
Not seen (cf Warham, 1955a, p. 166). The only one recorded from Eclipse Island was received by the Western Australian Museum 30 December 1938 from Mr A. E. Blythe. Its catalogue number is A4954, a female.

Black-tailed Native-Hen, *Tribonyx ventralis*
A few were seen about five years ago on Eclipse Island by Ian White, now headkeeper on the island. He described them as resembling Bantam Chickens with red bills and legs. Warham (1955a) describes similar observations by previous keepers, but presumed that they were Spotless Crakes.

Banded Plover, *Vanellus tricolor*
Not seen (cf. Warham, 1955a, p. 167).

Pacific Gull, *Larus pacificus*
At Eclipse Island one adult was seen 2 August and 9 August. Two were seen 3 August by Ian White. None were seen at sea outside King George Sound.

Southern Skua, *Catharacta lonnbergi*
One seen near Eclipse Island 3 August. At least five were seen over a school of tuna outside the entrance to King George Sound and at least three in the entrance 9 August.

White-fronted Tern, *Sterna striata*
At 15.15 hours 8 August two immatures and one adult of what we believe were this species were seen circling and diving close in to the south shore of Eclipse Island. The following features were noted: slender pale grey wings with pale tips, dark area in front on top of wing; long forked tail, white forehead with a sharp border between white and black on crown in the adult; black bill.

This bird has not been recorded previously in Western Australia. Other terns which resemble it are not likely to be in southern Australia in August. White-fronted Terns are known to disperse from the New Zealand Islands to eastern Australia in winter.

Fairy Tern, *Sterna nereis*
Not seen (cf. Warham, 1955a, p. 165).

Crested Tern, *Sterna bergii*
At least ten were seen in the entrance to King George Sound 2 August. One was seen at Eclipse Island 3 August. At least two were seen over a school of tuna outside the entrance to King George Sound. About 400 were seen resting on rocks at the entrance.

Sacred Kingfisher, *Halcyon sancta*
Not seen (cf. Warham, 1955a, p. 168).

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pitality while we were making use of their home as a petrel field laboratory. Mr R. D. Royce, Officer-in-Charge, Botany Branch, Department of Agriculture, Western Australia, kindly made the plant identifications for us. Dr R. W. George and Dr Glen M. Storr of the Western Australian Museum, identified a crustacean regurgitate and some skink specimens from Eclipse Island. Mr Frank Knight drew the figures.

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FROM FIELD AND STUDY

A Further Record of *Sminthopsis longicaudata* (Marsupialia, Dasyuridae).—On March 16, 1975, while on a Department of Fisheries and Wildlife survey, we obtained a female Long-tailed Dunnart *(Sminthopsis longicaudata* Spencer). It was collected at 26°51'S, 126°23'E in the proposed 1 050 000 ha Baker Lake Nature Reserve, in the Gibson Desert, south-west of Warburton, Western Australia.

The animal was flushed from a spinifex tussock at late dusk. The collecting site was on a laterite plateau supporting a low hummock grassland of *Triodia* sp. and *Plectrachne* sp. with occasional emergent *Hakea lorea* and *Acacia* sp. The soil was a shallow sandy gravel. About 10 m away was a laterite breakaway below which was a tall shrubland of *Acacia anenra* (Mulga) and *A. kempeana*.

Only four specimens have previously been reported. One of these is labelled only "Central Australia" (holotype, National Museum of Victoria, C7803) and the others all come from the Pilbara of Western Australia (W. D. L. Ride, *A Guide to the Native Mammals of Australia*, 1970, p. 201).

Ride does not provide any habitat information although H. J. Frith *(Wildlife Conservation*, 1973, p. 88) includes the species among ". . . mammals whose main habitats are woodlands do also live in grasslands where there are no trees." Our record extends the known distribution and provides specific habitat data of a currently extant population.